Delivering Benefits: The Integrated Ocean Observing System (IOOS®)

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What is IOOS®?
Delivering Benefits
Progress Through Partnerships
What is IOOS®?

- An Integrated and Sustained Ocean and Coastal Observing and Prediction System.

- A collaborative framework.

- A network of many different land-, water-, air-, and space-based facilities and technologies:
  - Platforms
  - Instruments and Sensors
  - Telecommunications Systems
  - Computer Systems

- Contributes to the Global Ocean Observing System (GOOS)
A National and Regional Collaboration

17 Federal Agencies

11 Regional Associations
U.S. Data Management & Communications

Other Third Party Users

IOOS/GEOSS

Data Providers

National Observing Systems
Regional Observing Systems

Data Management Modeling

End Users (YOU!)

Federal States, Industry, Local Tribes, Academia, NGOs

Data also returned to providers with processing.
All Observing Assets in GOM (Fed/Non-Fed)

Includes: Private, Academic, State, NOAA/NDBC, NOAA/CO-OPS, NOAA/IOOS*

* Includes IOOS Regional Associations
US IOOS®: Delivering New Observing Capability

• >100 Coastal High Frequency Systems
• Uses: SAR; Oil Spill; Harmful Algal Bloom; Ocean Circulation

96 hr: Without HFR 36,000 Km²
96 hr: With HFR 12,000 Km²
The Initial Global Ocean Observing System for Climate
Status against the GCOS Implementation Plan and JCOMM targets

- Total in situ networks: 61%
- Surface measurements from volunteer ships (VOS/lim): 87%
- Global drifting surface buoy array: 100%
- Tide gauge network (GCOS subset of GLOSS core network): 59%
- XBT sub-surface temperature section network: 81%
- Profiling float network (Argo): 100%
- Repeat hydrography and carbon inventory: 62%

Reference time series: 48%
Global reference mooring network: 31%
Global tropical moored buoy network: 73%
IOOS®: Delivering the Benefits

Improve Safety

Enhance Our Economy

Protect Our Environment
What is IOOS®?
Delivering Benefits
Progress Through Partnerships
Protecting Coastal Communities

- Hazard and ecosystem assessment
- Oil and hazardous materials spill response
- Support for coastal management
- Habitat loss management
- Environmental mapping
Reduced Public Health Risks

Increasing warning of harmful algal blooms (HABS).

Managing pollutants from storm water to reduce beach closures.
Safe and Efficient Navigation

- Coastal Data Information Program (CDIP) providing wave observations, nowcasts, and forecasts.
- SCCOOS providing HF Radar surface currents.
- NOAA Physical Oceanographic Real-Time System (PORTS)
Benefits Across Disciplines

Public Utilities

Ecological Management

Weather & Climate

ENSO Observing System

…Water Supply, Agriculture, Commercial Fishing, Energy, Tourism and more…
US IOOS® support to: Energy Sector

**Pre -Construction**
- Avian Studies
- Geophysical/Geotechnical Investigations
- Met Tower Installation
- Wave Sensor Deployment
- Staging Port Development

**Construction**
- Foundation Installation
- Sub-sea Electrical Cable Installation
- Offshore Substation Installation
- Turbine Installation

**Post-Construction**
- O&M Activities; Decommissioning
What is IOOS®?
Delivering Benefits Progress Through Partnerships
Industry Participation

The Observing Subsystem
• Buoys, gliders, gauges.

DMAC Subsystem
• Boeing, SAIC, and ASA working with IOOS regions

Modeling and Analysis Subsystem
• Noblis, Inc. helping create inundation forecasting (CIPS)

Partnerships
• Shell and NOAA NDBC

Value-Added Companies
• Surfline; ROFFS; Weatherflow
US IOOS® and US National Water Quality Monitoring Network - example

- Serve observational data according to common OGC/WMO standards
- Feeds multidiscipline prediction models for eutrophication, beach health, invasive sp., etc.
- Integrate watershed “circulation” model with GLOS/IOOS into a Virtual Observatory
- 4 Global scale sites
- 3 Regional cabled sites in the NE Pacific
- Coastal scale arrays: Mid-Atlantic Pioneer Array, PNW Endurance Array
- Each scale incorporates mobile assets
- Cyberinfrastructure: enable adaptive sampling, custom observatory view, collaborative analysis
- Interfaces for education users
- Academic Institutions lead the building of OOI
US IOOS®: Supports Sensor Verification and Validation

- A third-party testbed for evaluating sensors and sensor platforms
- A forum for consensus and capacity building
- An information clearinghouse for observing technologies
The Future of U.S. IOOS

Operational IOOS

– Network of Observations
  • biological
  • physical
  • chemical

– Fully developed Data Management and Communications (DMAC)

– Robust Partnership with Regional Coastal Component

– Models & decision tools at resolution to support coastal communities
Questions